

interpretive prospectus

SEQUOIA and KINGS CANYON

LODGEPOLE VISITOR CENTER

NATIONAL PARKS / CALIFORNIA



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INTRODUCTION

The Lodgepole Visitor Center was completed several years ago, but interpretive exhibits were never built for the new structure. Two exhibit plans were prepared for Lodgepole. The first plan was unsatisfactory, and the second became obsolete because of changes in the general development concepts for the parks. As a temporary expedient, the exhibits from the old museum at Giant Forest were transferred to Lodgepole, and the museum building was demolished.

In 1968 the Park Service selected a master plan team to study Sequoia and Kings Canyon National Parks. Once the general concepts of this study were established, another team was appointed to consider interpretive developments in the light of the new master plan proposals.

The interpretive team visited the parks in May of 1970. They produced a general interpretive prospectus for the two parks, as well as this prospectus for the Lodgepole Visitor Center. The team consisted of:

Russell J. Hendrickson, Chief, Division of Museums, Harpers Ferry Center

William T. Ingersoll, Interpretive Planner, Office of Environmental Planning and Design, Western Service Center (Team Captain)

Richard R. Krepela, Assistant Chief, Division of Audiovisual Arts, Harpers Ferry Center

John J. Palmer, Chief Naturalist, Sequoia and Kings Canyon National Parks

Marc Sagan, Chief Interpretive Planner, Harpers Ferry Center

Saul W. Schiffman, Curator, Division of Museums, Harpers Ferry Center

GENERAL CONCEPTS

The general prospectus calls for two major interpretive treatments in the Lodgepole Visitor Center: the first is a geographical treatment of the Sierra Nevada to be handled by a narrative/exhibit; the second is an esthetic interpretation of the sequoia to be handled by a motion picture. In addition, several other measures are proposed to emphasize certain interpretive points and to improve general orientation.

The Lodgepole Visitor Center was designed to serve as a general reception facility for all visitors to Sequoia National Park. Consequently, the building is large, and the interior spaces are ample for secondary exhibits, and even for traveling exhibits.

The orientation functions in the lobby of the center require a better location for the information desk and some new informational devices. A random-access slide-projector, an exhibit/audiovisual unit for providing popular statistics about sequoias, and an orientation map will all help considerably. The display of sales publications should also be redesigned and relocated to promote sales and to relieve congestion around the information desk.

INTERPRETIVE THEMES

Interpretation at Lodgepole will be based on the interpretive theme section of the general prospectus — reproduced here as Appendix C. The major interpretations will provide a general introduction to the two parks and their resources, and will not involve detailed orientation to specific sites and points of interest.

THE SIERRA NEVADA

In the existing exhibit room, the major program will be a narrative presentation, describing the influence of the Sierra Nevada on patterns of agricultural settlement, location and growth of cities, development of road systems, recreational pursuits, climate — both east and west of the range, distribution of sequoias both historically and today, and possibly other related factors. The treatment should be geographical rather than geological, although it will consider the tectonic and glacial forces that have shaped the Sierra as a watershed, habitat, and recreational resource. Highlights of the program will show the central importance of the Sierra and its water resources, will emphasize the fact that these resources are fixed and finite, and will explore the consequences of continued growth of population, developments, and activities based on these resources. Farms, cities, industries, wildlife populations, and forests cannot expand indefinitely, because they are all in competition for the same limited water supply. The program will use the interpretation of the Sierra Nevada in Appendix C.

THE GIANT SEQUOIA

The auditorium will house a film emphasizing esthetic appreciation — rather than the natural history — of the sequoias. This program will select material from the interpretation of the sequoia in Appendix C. We do not expect the script to handle all of this material or to serve as a teaching aid. Rather it is intended that the program impress feelings for the sequoias, and entice — or perhaps inspire — visitors to take quiet walks in the sequoia groves.

INTERPRETIVE MESSAGES AND MEDIA

THE SIERRA NEVADA

The interpretation of the Sierra Nevada should be presented by means of an 8- to 10-minute narrative, utilizing a map of California and Nevada, which features the Sierra, the flanking valleys, and possibly the Coast Ranges and Pacific shore. The design of the map may be two- or three-dimensional. Lighting and other special effects will be needed to show waterflow, snowfall, forests, deserts, and other geographical elements. Special lights may also be used to identify important places referred to in the narrative. The program may require equipment for projecting onto one or more screens to supplement the map. Some graphics may be helpful to illustrate such subjects as engineering structures and ecological communities. However, since the interpretive message is primarily geographical and should relate directly to the map, relatively few graphics should be used. In addition, the proposed photo show will probably provide enough graphics in the room to support this interpretation. The pollution exhibit discussed below should receive some treatment in this map program. Visitors — an average of 1,700 a day during the summer — should watch the program in casual comfort, such as sitting on steps or using a leaning rail. It may be desirable to isolate the map program from the other functions in the visitor center.

THE GIANT SEQUOIA

A 10- to 15-minute film will contain some of the sequoia material in the interpretive theme section. It should also include some winter material (see page 6). However, the film should deal with esthetics rather than

natural history. Through the use of dramatic photography, an original music score, and a minimum of narration, this film will convey the feeling of awe, solemnity, and even reverence that many people experience when they visit the sequoia groves. The film will contain a minimum of information about the life cycle of the sequoia. That part of the sequoia story will be used only insofar as it can be interpreted with dramatic cinemagraphic imagery. We envision that many slow camera-moving scenes will be incorporated into the film. Such cinemagraphic devices will show the intricate designs that form as the sunlight falls through and among the giant trees. Thus this film, aided by an inspired musical score, will suggest the unusual experience the visitor may have if he visits the groves in person. The film itself should be a work of art, inspired by the unique and awesome beauty of the sequoia.

Since this auditorium will be used principally to present an interpretive film, the projection booth should house 16mm professional gear. Projectors using 5,000-foot continuous-run reels are specified. A high-quality sound-system is also needed. The projection booth should have additional equipment to allow for complete flexibility, including a microphone and remote controls at or near the screen area, possibly on a small stage. Slide-projection equipment using Xenon illumination is also specified, since the larger screen will require more light output from these slide projectors. A high-quality stereo tapedeck, capable of playing standard audio programs and special presentations with stereo sound, should also be included.

The interior of the auditorium requires some treatment. A substantially larger screen, suitably masked and draped with an operable curtain, is called for. The wall areas need acoustical treatment in order to reduce or eliminate the presently high room reverberation.

INTERPRETIVE SUB-THEMES AND EXHIBITS

In addition to the program on the Sierra, the exhibit room will contain exhibits dealing with research and management, pollution, esthetics, wildlife, and winter use. These exhibits need not — and probably should not — be constructed to last as long as the Sierra exhibit. Two of the exhibits should be installed at one time. After a few years of exposure, funds should be programmed to replace one or both with other exhibits from the group. An exception might be made for the esthetics exhibit; we envision a kind of photographic display that might be installed as a permanent wall treatment for the exhibit room.

RESEARCH AND MANAGEMENT

At these two parks the National Park Service has departed from traditional management practices as a result of scientific research. It was suspected for many years that the lack of sequoia reproduction was caused by fire protection. Research in the past decade has demonstrated that this was indeed the case. In fact, the seeds germinate only in mineral soil, and the seedlings require open sunlight. Although running water or the fall of a large tree can provide the necessary conditions for germination and growth, historically, natural fires did most of the work by clearing away the duff and litter on the forest floor and exposing the necessary mineral soil to the seeds. At the same time, the fires destroyed enough competing tree species to open the forest canopy, allowing the sunlight to reach the sequoia seedlings. Today the Service is deliberately burning away sections of the forest to allow the sequoia to reproduce, and to restore the conditions that existed in the forest before men began to prevent the spread of fire. An exhibit describing past and present management practices could utilize photographic documentation of the research studies.

POLLUTION

Air pollution from the Central Valley now obscures many of the views in Sequoia National Park. Many backcountry lakes and streams are becoming polluted. Improper disposal of solid wastes also causes pollution. It is important to handle this subject. Some material can be included in the programmed exhibit on the Sierra. The esthetics exhibit might also include some pollution material, but it is not the best medium for the subject, because it is primarily a photographic show and cannot discuss the consequences of pollution, and because it may even have trouble distinguishing air pollution from natural haze or fog. Neither of these exhibits offers an effective medium for graphically presenting the causes of the pollution. An animated cartoon dealing specifically with the subject of pollution should be designed and included in the interpretive program.

ESTHETICS

For some visitors the beauty of the two parks is more important than a natural rarity like the sequoia. For most people, however, esthetic appreciation of the parks is limited to the sequoia groves. Relatively few people are exposed to the High Sierra, except as seen from Moro Rock and one or two other overlooks. A photographic exhibit, somewhat like the photomural shows in the Yosemite

Visitor Center and at the National Park Service 50th Anniversary, could treat the esthetics of the parks. While the photographic treatment should include works of art — not simple record shots — the subject matter should suggest the web of life and stimulate people to look more attentively at what they see, to think about what they cannot see, and perhaps to ask questions. The exhibit will not have labels. The photographs should be exquisite, but the show should not be art for art's sake. We have ulterior motives. We want to encourage people to respond directly to natural resources rather than to simply read about them. We want people to think about the interrelationships of plants, animals, soils, climates, and such things. The exhibit should be organized so that visitors will draw conclusions. A great many subjects are available. All of them can be photographed with love. The following is a partial list: sequoias, high country, rivers, lakes, fir forest, ponderosa forest, chaparral, desert, fog, rain, seasons, granite, minerals, flowers, snow blowers, fish, lichens, butterflies, microbes, fungi, caterpillars, caves, wildlife, fires, marshes, talus, trails, hikers, and rangers. If public interest in the pictures seems to justify it, the pictures might be used in a publication.

WILDLIFE

An exhibit on wildlife observation should help visitors to learn where and when they can see wildlife. The material may be interwoven with the photos in the esthetics show. The only large animal that visitors are likely to see is deer. Bears occasionally show up in the campgrounds. The exhibit should also include information about the common small mammals, birds, and fishes.

WINTER

Some push for winter use of the park is needed. The subject need not be a separate treatment. The photo show can include winter scenes showing visitor activities, such as the guided snowshoe walk. Photographs showing winter maintenance activities, removing snow from the highway in particular, would offer helpful hints that the park is open in the winter. In addition, some winter material should be included in the motion picture on sequoias.

TRAVELING EXHIBITS

The Lodgepole auditorium is larger than necessary. Its seating capacity of 170 could be reduced to 100, and the excess space could be closed off from the auditorium and made available for traveling exhibits. It is also recommended that the walls of the auditorium be used for the presentation of traveling exhibits, such as the Artists in the Parks show or the Woody Williams photography show. The Harpers Ferry Center is beginning to circulate traveling exhibits of general interest, and this program is expected to grow during the next few years. In addition, traveling shows can be obtained from the Smithsonian Institution, the American Museum of Natural History, and other major museums. These exhibits will enable the Lodgepole Visitor Center to offer more current displays to supplement the permanent exhibits.

THE LOBBY – INFORMATION AND ORIENTATION SERVICES

The basic functions assigned to the lobby are information and orientation. At present the information desk and a relief map provide the only orientation services.

The information desk is inconveniently located between the two entrances to the auditorium. On a busy day, auditorium traffic causes congestion at the desk, as do browsers around the display of sales publications. The relationship between the desk and the doors should be redesigned to improve circulation at the desk, and the sales-publications display should be detached from the desk. The desk could be enlarged at the same time to accommodate two information clerks and a sales clerk. Alternative drawings, included in Appendix D, show these possibilities.

A random-access slide-projector is proposed for the information desk. The slides for this projector should include pictures of important sites and a few maps. The staff will provide a list. Since slide-projectors will be used in several locations in the parks, a detailed description is included in Appendix B.

A statistical pod, described in Appendix A, will dispense basic information about sequoias. The pod should be located some distance from the information desk so that people using it will not add to the congestion.

A large-scale map of the Giant Forest/Lodgepole area is needed on one of the walls. It should be located away from the doors. The function of this map will be to provide answers to questions that visitors ask most frequently — where to buy food, where to eat, where to fish, where to take a half-day hike, where to take an overnight hike. The map should cover the area from Moro Rock on the south to Silliman Pass on the north and from Bearpaw Meadow on the east to Crystal Cave on the west. It should show restaurants and food stores, roads and trails, and lakes and creeks. The park staff will identify any other features that should be shown.

The sales counter is now part of the information desk. It is used to display about 50 publications, plus maps. The maps are displayed in a Multiplex. A new display should be designed to promote sales. It should be located so that browsers will not interfere with activity at the information desk or block the doors to the exhibit room or the auditorium.

Because the lobby is so large, the empty walls frequently make the room seem cold and formal. Decoration could be combined with low-key interpretation by installing a series of pictures of attractive subjects like the Watchtower, Pear Lake, Alta Peak, Silliman Pass, and the Washington Tree or another sequoia that is off the beaten path. Labels — with titles only — are proposed. The pictures are intended as decoration and as an invitation to explore. They should exclude features like Moro Rock and the General Sherman Tree, which everyone visits anyway.

On the porch behind the lobby visitors look into a lodgepole forest. This forest is located at a lower elevation than is usual. Apparently, cold air draining down the Tokopah Valley from the high country creates a suitable habitat for the trees at this elevation. The porch does not offer a view up the valley. One or two panels are needed on the porch to explain the factors of terrain and climate that produce the forest.

APPENDICES

A: STATISTICAL POD

An exhibit/audiovisual unit that we are calling the statistical pod will be used to disseminate basic information about sequoias. Units will be installed at the Grant Grove Visitor Center, the Lodgepole Visitor Center, and the portable visitor-contact station at Giant Forest. As envisioned, the statistical pod will be relatively small, but eye-catching, and will be built around a rear-screen image using a flow projector. The design of the “flow” program is such that one subject seems to dissolve into another. To take advantage of the pseudo-animation possible with the flow projector, to maintain visitor interest during the 2-minute program, and to avoid prolonged browsing by the visitors, it is suggested that the rear-screen program contain the entire statistical packet. Highlights from this program will form the theme to be used in the support exhibit and graphics, and a pamphlet rack of some sort will be incorporated into the exhibit, so visitors can take leaflets that will also highlight the basic sequoia facts. This free leaflet may have silhouettes on its reverse side, illustrating the shape of a sequoia from youth to old age in about three or four steps. However, neither the exhibit nor the leaflet will include more information than is given in the flow-projector program.

The function of the statistical pod is to dispense basic figures about sequoias — height, weight, diameter, age — and record statistics of trees like General Grant and General Sherman. It is not an interpretive device and should avoid messages about the ecology or the life cycles of the trees.

B: RANDOM-ACCESS PROJECTOR

We propose random-access projectors to be used by the information-desk attendants at Grant Grove, Lodgepole, and Giant Forest. These projectors will serve as aids in providing answers to visitors’ questions. The park staff will provide the information for development of the slide series, and cost estimates should include funds to cover the preparation of slides. Rather than mounting the projection equipment in a wall behind the information desk or projecting the images onto a wall surface, it is suggested that a housing be built for the desk so that the screen is perpendicular to the desk and above-average eye-level. This would allow the attendant and the visitor to point out various features on the screen.

C: INTERPRETIVE THEMES

Sequoia and Kings Canyon National Parks are noted primarily for their preservation of numerous sequoia groves and for their fine High Sierra wilderness. For that reason the following two interpretations of the Sierra Nevada and the giant sequoia are included. In general, these are the thoughts we intend to communicate by the various media. Not all media will attempt to present the whole message. In the Giant Forest, for example, a prospectus is needed for the development of the transportation system. Then, the sequoia treatment outlined below will have to be broken up into sections suitable for interpretation at individual stops along the tour route. On the other hand, the treatment of the Sierra Nevada at the Lodgepole Visitor Center calls for comprehensive interpretation in a single programmed exhibit.

The Sierra Nevada

The Sierra Nevada rises as a fault block 400 miles long in eastern California and western Nevada. The escarpment on the east side of the range towers almost 11,000 feet above the Owens Valley in the vicinity of Mount Whitney. Further to the north, the relief diminishes progressively until it is only 2,000 or 3,000 feet in the vicinity of Honey Lake. Kings Canyon at the south is 5,000 feet deep; Yosemite Valley, about 3,000 feet deep; and Feather River Canyon at the north, about 2,000 feet deep. Only a dozen miles separate the crest of the range at Mount Whitney from Owens River to the east. West of the crest, however, the mountains slope more gently, and Whitney lies about 80 miles from the floor of the Central Valley.

The natural landscape of the Central Valley was formerly a series of swamps and lakes in a semi-desert setting. There was little rainfall, but the natural waterflow from the Sierra filled the lakes and rivers throughout the year, and the valley supported abundant wildlife. Man has altered the natural drainage systems through massive engineering works, modified the natural landscape, driven out the wildlife, and converted the valley floor into one of the most profitable agricultural districts in the United States. Simultaneously, the human population of the valley has skyrocketed with this new agricultural base. The large populations, with their cities, industries, and automobiles, have polluted the air, and this pollution now extends into the Sierra, where it already threatens the ponderosa forest and may in time damage the valuable mountain watershed.

On the western slope, the Sierra drainage supplies water for the San Joaquin and southern Sacramento Valleys. The rains in the valley usually stop by February or March and do not fall again until the next winter; therefore, water supplied by Sierra drainage is critical. In the High Sierra, snow rather

than rain falls, and geology is a major influencing factor. During the last glacial epoch, these mountains were scraped clean, leaving hundreds of square miles of exposed bedrock. The hard granites erode slowly, and the thin soils and glacial gravels hold only limited amounts of water in the small lakes at higher elevations. The spring melt charges the lakes and underground basins, but the smaller streams run dry in the summer. The major rivers — the Kern, Kaweah, Kings, San Joaquin, Merced, Tuolumne, Stanislaus, Mokelumne, American, Yuba, and Feather — never run dry. Their waters enter the Central Valley all year long, although in smaller quantities during the summer and fall. A series of dams have been built on these rivers. The Friant Dam, keystone of a great engineering project, turns the natural flow of the San Joaquin south to join the Kern River near Bakersfield. To keep the San Joaquin running on its natural course, the Delta-Mendota Canal carries Sacramento River water south to Mendota, where it enters the San Joaquin channel to run north again. In Raymond Dasmann's works, "the entire system sounds as though it was devised by the Red Queen in *Alice in Wonderland* but it actually represents an engineering masterpiece, and truly does make sense." Virtually all of the water flowing into the Central Valley from the Sierra Nevada is controlled and directed for specific purposes, and the natural "holding vessels" — the snow, the lakes, and the subterranean aquifers — are supplemented by the manmade reservoirs at lower elevations, so that the flow of water into the valley can be stretched out more evenly during the entire agricultural year.

In contrast, the scene to the east of the Sierra is largely desert. The moist air from the ocean drops a first load of rain on the Coast Ranges. The Sierra, which is a much loftier range, takes most of what is left, so that the eastern valleys lie in a rain shadow. Water is available only in limited quantities. All of the east-side river systems drain into enclosed basins — without outlets until the Los Angeles Aqueduct was built after the First World War. A series of salt lakes — Owens, Mono, Walker, Pyramid, and Honey — in these basins receive the meager flow of water. There the water evaporates too fast to fill the basins and create a drainage to the sea. Honey Lake evaporates fast enough to dry up entirely from time to time, although the other lakes always have some water. Agriculture in these basins depends on irrigation, but the minimal watershed, the dry climate, and the withdrawals for the Los Angeles area limit agriculture to a relatively small area around Bishop, Lone Pine, and a few other communities.

The Los Angeles Aqueduct was the first of several great water projects designed to bring water to that city, which, as a result of these public works, has grown in to the third largest metropolitan area in the country. Although the pollution and congestion of Los Angeles are notorious, the city will continue to attract more people as long as water can be imported to support them.

In addition to its role as a watershed, the Sierra has affected people in other ways. First, it forms a great barrier to travel. Second, within it are many recreational opportunities and profitable resources.

Although a number of highways have been built across the Sierra, there is still no all-year road that crosses the Sierra in the 240-mile section between U.S. 50 east of Sacramento and State Route 178 east of Bakersfield. There are no through roads at all between the Tioga Road through Yosemite National Park and State Route 178, a distance of about 160 miles. Three characteristics of the Sierra limit the California highway system. First, the mountain passes like Tioga Pass and Carson Pass are high. All of them rise above 8,500 feet. They receive heavy snowfall. Keeping them clear of snow in the winter would be a costly and difficult task. Second, the mountains east of the crest drop precipitously. In places they fall as much as 1,000 feet a mile. In engineering terms, it would cost a great deal to build a highway in such terrain. Finally, the rain shadow of the Sierra creates an inhospitable climate in the parched basins to the east of the mountains. The land supports few people, and this fact must be weighed against the high costs of both construction and maintenance. There has long been talk of extending State Route 168 over the crest to connect Fresno and Bishop, or of building a new road nearer to Devils Postpile National Monument. However, the costs would be great, and the project is not likely to materialize in the near future.

Within the Sierra there are a variety of environments, differing principally because of elevation and exposure. One of these, of course, is the sequoia forest. Others are the semi-desert, the chaparral, and the ponderosa forest below the sequoias, and the fir forest and the sub-alpine and alpine communities above them. There are lumbering operations in the mountains, as well as real-estate developments. Today the high mountains above the chaparral serve as great playgrounds. The scenery is spectacular. A few highly developed mountain environments like Lake Tahoe and Yosemite Valley draw large numbers of tourists. These resort areas are important facets of the popular California image, and, although they are hardly typical of the character of the State, they are widely known.

The opportunities for camping and hiking in the Sierra are some of the best in the country. Formal campgrounds are numerous. In the backcountry the camps are more primitive, but well-established. The main attraction of the backcountry is the splendid mountain scenery. The Sierra granites are generally light-colored, and much of the high country is clear and extraordinarily bright, with a dry summer climate that is comfortably warm in the day and pleasantly cool at night. This is the Sierra high country, a wilderness in the backyard of Californians.

Wilderness is many things to many people. For most people it need be no more than a backyard or a small park. For some it is a large enough place to get lost, but to get lost safely — a Golden Gate Park, a Central Park, or a Fairmont Park. For others it is a walk in the woods, still not too far from home. For some it is the goal of a journey, where the world of nature dominates and the presence of man is shown by little more than a trail and perhaps a passing stranger. For a few, nothing less than the Arctic Slope will do — no trace of man's work, miles from civilization, and only the company of the wild.

Why is wilderness important to these people? For some it is a natural watershed. For others it is the object of scientific study. For some it represents a home for wild animals. For many it is simply a place to get away from too many people and too much busyness.

Whatever the wilderness may mean personally to people, the Sierra wilderness is one of the most popular in the country. With no more civilization than the trails under their feet and the packs on their backs, thousands of people visit the Sierra backcountry every year.

The Giant Sequoia

Most people think of sequoias as the oldest, biggest, tallest, heaviest, and thickest trees in the world. They are not. Bristlecone pines are older. Redwoods are taller. Sequoias hold the record for being the largest trees by volume. Someone else will have to decide whether the taller tree or the heavier tree is the "bigger" tree. A number of individual trees — notably the General Sherman and the General Grant — have become famous because of their size, and people admire the record statistics of these particular trees. This is also true of some other trees, which have become famous for various reasons. Once these statistics have been presented, many people will feel that they have digested the facts and therefore now understand the giant sequoia. That is not necessarily the case.

In fact, matters of size and age may be of relatively little importance. The sequoia has other interesting characteristics. It has had a checkered history in the conservation movement, but has not been the subject of nearly as much controversy as the redwood. Its characteristics make it relatively immune to fire, disease, and parasites. Yet it is not prospering. Before the Ice Age, the sequoia was an important species and ranged widely throughout the world. Now its range is limited to a few degrees of latitude and a few thousand feet of elevation in the Sierra Nevada. The Pleistocene glaciations apparently destroyed whole forests of sequoias and left behind only the relict groves we have today. It might be an interesting investigation to try to identify what

natural factors limited the spread of the groves a century ago. We believe that, since that time, management of the forests has reduced the natural catastrophes that are favorable to sequoia reproduction, and that the groves may now be shrinking. Sequoia seeds require mineral soil to germinate. After a few decades, young sequoias develop thick and relatively fireproof bark. Consequently, a good fire in a sequoia grove clears out the duff, prepares the soil for the seeds, and does little harm to the mature trees.

Only two species related to the sequoia are known to survive in the modern world. The redwoods of California require a somewhat moister climate. They are often taller than sequoias and generally more gracefully proportioned. Sequoias are somewhat squat in shape — very large, but not very stately. Sequoias reproduce only from seeds. Redwoods, on the other hand, supplement reproduction from seeds by sprouting shoots from burls and stumps.

The sequoia's other living relation, the metasequoia (or dawn redwood), is an Asiatic tree. Perhaps its most unusual feature is that it is deciduous. Its leaves, which resemble hemlock needles, fall off in the autumn, and new leaves bud in the spring. The two American trees are large; the Asiatic metasequoia is not.

Under natural conditions, sequoias grow in large groves rather than forests. The groves are naturally rather parklike. Fire normally passes through them often enough so that underbrush is reduced, and competing trees are killed. The trees grow at relatively high elevations, and the groves are generally shady and cool. Some specialized insects live out their entire lives in the upper branches of sequoias, but otherwise the wildlife of the sequoia grove differs little from that of the neighboring forests.

The groves affect many people emotionally. The trees are impressively large, and many of the visitors see them only once in a lifetime. The great age of the trees is also impressive. Trees at least 2,000 years old are common, and some are over 3,000 years old. Although these sequoias are not as old as some bristlecone pines in the White Mountains nearby, they are respectably old.

Sequoias have unusual beauty. Their proportions are somewhat awkward. The vicissitudes of many centuries frequently produce strange and unbalanced crowns. Their trunks rise without much taper, and their bases sit heavily on the ground like elephants' feet. Yet they attract people — a little like elderly matrons who have seen a good deal of life, but have come out rather the better for it.

Many of the trees bear remarkable fire scars; some are deep, cavelike hollows in the lower parts of the trunks, and are many years — or even centuries — old. Some

fire scars are so huge that they seem almost surely to have weakened or damaged the anatomy of the tree. However, as long as the scars do not ring the trunk completely, the sequoia will survive.

The wood fractures badly. The tendency of sequoias to fracture during felling probably accounted for the failure of loggers to make a go of chopping them down. A number of trees lie on the ground today, mostly the result of natural falls. The trunks are shattered into several large pieces, and countless small fragments lie about. As is often the case with fallen trees, the plate of exposed roots seems hardly large enough to have supported the tree.

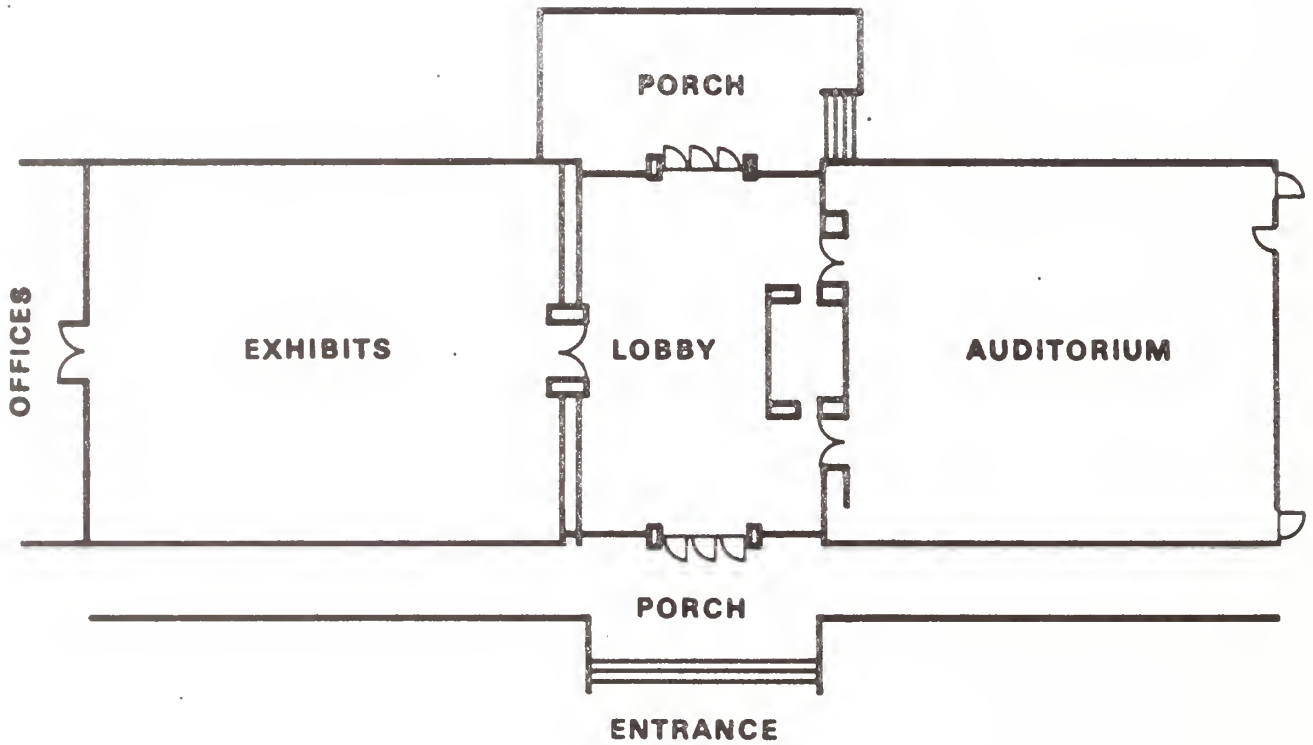
The tendency to grow in groves of fairly stable size is a special characteristic of sequoias. It is not entirely understood why the trees should grow in this manner, but they do. Some 60 groves are to be found along the whole length of the Sierra, but they are concentrated in the southern half of the range. Before men began to interfere with their natural cycles about a century ago, the sequoia groves were apparently stable in size, neither extending their range nor losing ground.

Human treatment has not been kind. What has happened in the last century has been a tragedy: the motives were good, but the results have been unfortunate. In an effort to preserve the trees, we protected them from fire, not realizing that natural fires aid sequoia reproduction. The seeds will germinate only on mineral soil, and the seedlings require open sunlight. In addition, several decades of fire protection have multiplied the fuels on the forest floor. A century ago, it was a rare fire that had the fuel to burn hot enough and long enough to seriously injure mature sequoias. Now, however, a fire might find enough available fuel to destroy several of the big trees.

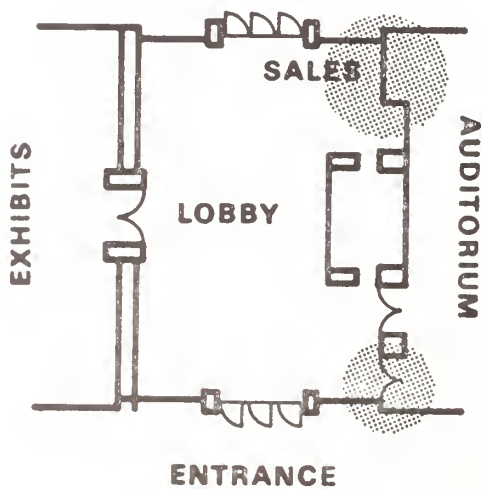
The general interpretation of the sequoias should "turn on" respect for their rather specialized habitat. Mature sequoias are remarkably sturdy, but the seedlings are fragile, and the seedling stage is crucial to the survival of the sequoia population. Further, it may be this stage in the life of the tree that determines the narrow and curious range of the grove. Cultivated sequoias have done well for many years, but the natural grove depends on a variety of precise conditions for its perpetuation. Unless we are to grow only hothouse sequoias, it is essential that we restore and preserve the environmental conditions necessary to the survival and reproduction of the natural species. All species have some critical requirements. Unless we are to develop some kind of hothouse man, we must also preserve the conditions necessary to our own survival and reproduction.

D: ALTERNATIVES FOR LOBBY FLOOR PLAN – VISITOR CENTER

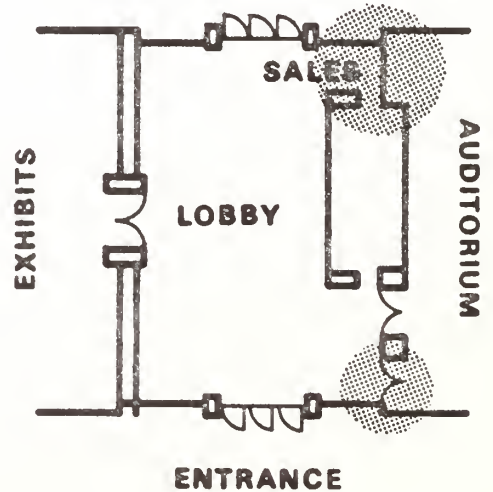
EXISTING



ALTERNATIVE A



ALTERNATIVE B



E: COST ESTIMATES – INTERPRETIVE DESIGN, CONSTRUCTION, AND EQUIPMENT

Audiovisual:

Sequoia film	
Equipment	\$11,000
Script	5,000
Production	17,000

Statistical pods (3) for Lodgepole, Grant Grove,
and Giant Forest

With flow projector	
Equipment	1,600
Program	4,800

With motion picture	
Equipment	4,800
Program	7,500

Because of the small size of the image, each statistical pod
may require two or three flow projectors. Only one
motion-picture film would be required.

Random-access projector	
Units (3) and backup equipment for Lodgepole, Grant Grove, and Giant Forest	3,000
Program	3,500

Exhibits:

All exhibits, including design and construction of statistical pod (except AV), and excluding four short-term exhibits	\$60,000
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The remaining short-term exhibits should be estimated
shortly before they are programmed.

Structure:

Lobby alterations

Sales display case (50 l.f. shelving)	\$ 300
Remove double doors (\$200), close opening with matching wall (\$400), add back counter and fascia (\$300).	900
Extend counter and relocate gate	800

Remove fire-hose cabinet (\$200), remove blind door and storage wall (\$100), add pair of doors (relocated) and trim (\$600), add wing wall and posts to match lobby and auditorium elevations (\$1,400), add furred space and fire-hose cabinet (relocated) elsewhere in auditorium convenient to water service (\$700)	3,000
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Force-account allowance @ 20% of \$5,000 subtotal	1,000
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Auditorium alterations

Engineering and design study of acoustics and esthetics .	2,000
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Estimates for physical alterations will be included in the study.

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